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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/738,181	12/15/2000	Peter Wehrli	29089/36910	2305

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EXAMINER	
ORTIZ RODRIGUEZ, CARLOS R	

ART UNIT	PAPER NUMBER
2125	12

DATE MAILED: 12/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/738,181	WEHRLI ET AL.
	Examiner	Art Unit
	Carlos Ortiz-Rodriguez	2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4 and 6-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delio U.S. Patent No. 5,170,358 in view of Gebauer et al U.S. Patent No. 4,748,554.

With respect to claim 1, Delio's reference discloses a method for disturbance sensing in a drive system of a numerically controlled machine tool (see fig. 1, element 26),
in which at least one drive motor for positioning a machine part is coupled via one or more transmission elements to the machine part(see fig.1, element 4),
the method comprising the steps of: measuring a position of the moving machine part directly on the machine part (see col. 5, lines 60-66)
and also indirectly at at least one location in a transmission chain (see fig. 1, element 14)
comparing the direct and indirect position measured values (see col. 6, lines 3-6).

Delio does not disclose using the comparison between the direct and indirect positions value to record a disturbance with consideration of the actual operating conditions on fulfillment of a prescribed criterion.

However, Gebauer et al. discloses using the comparison between the direct and indirect positions value to record a disturbance with consideration of the actual operating conditions on fulfillment of a prescribed criterion (see col. 3 lines16-24).

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify Delio's invention to include the step of utilizing the comparison of positions to record a disturbance.

One of ordinary skill in the art would have been motivated to do this modification because this type of comparison is commonly utilized in disturbance monitoring and sensing as suggested by Gebauer.

Regarding claim 2, Delio in combination with Gebauer et al. disclose all the limitations based on claim 1. Delio additionally discloses a method wherein the indirect measurement of the position of the machine part being moved is conducted on the drive motor (see fig. 1, element 14).

Regarding claim 3, Delio in combination with Gebauer et al. disclose all the limitations based on claim 1. Gebauer additionally discloses a method as defined wherein a difference value between the direct and indirect position measured values is used as criterion for recognition of a disturbance (error)(see col. 3, lines 16-24).

Regarding claim 4, Delio in combination with Gebauer et al. disclose all the limitations based on claim 3. Delio further discloses a method wherein the difference value is compared

with one or more prescribed threshold values, the one or more prescribed threshold values being determined with consideration of actual operating conditions, and wherein predetermined measures are automatically initiated on at least one of reaching and surpassing the one or more prescribed threshold values (see abstract line 23-28).

Regarding claim 6, Delio in combination with Gebauer et al. disclose all the limitations based on claim 4. Delio further discloses a method wherein a calibration procedure is performed to determine machine-specific threshold values in which machine-specific standard disturbance situations are run(see col. 1 lines 34-37).

Regarding claim 7, Delio in combination with Gebauer et al. disclose all the limitations based on claim 1. Gebauer further discloses a method wherein collision sensing is performed through the use of determining a difference value between the direct and indirect position measured values and considering the actual operating conditions (see col. 3, lines16-24).

Regarding claim 8, Delio in combination with Gebauer et al. disclose all the limitations based on claim 7. Gebauer further discloses a method wherein disengagement of at least one of advance movement of the moving machine part and reversal movement of the moving machine part is initiated directly after collision sensing (see col. 3, lines 16-24, and col. 4, lines 16-23).

Regarding claim 9, Delio in combination with Gebauer et al. disclose all the limitations based on claim 7. Gebauer further discloses a method wherein possible damage is evaluated after collision sensing with consideration of at least one of a determined collision direction, a

collision speed and a collision depth and correction is activated to prevent damage when necessary (see col. 4, lines 9-16)

Regarding claim 10, Delio in combination with Gebauer et al. disclose all the limitations based on claim 7. Gebauer further discloses a method as defined in claim 7, further including a preventive collision protection method used in combination with collision sensing (see col. 4, lines 44-48).

Regarding claim 11, Delio in combination with Gebauer et al. disclose all the limitations based on claim 10. Gebauer further discloses a method as defined in claim 10, wherein the machining process is monitored by an active collision protection system and collision monitoring is initiated by difference formation of the direct and indirect position measured values only upon failure of the active collision protection system (see col. 4, lines 34-40 and col. 10, lines 61-66).

Regarding claim 12, Delio's reference discloses a device for disturbance sensing in a drive system of a numerically controlled machine tool (see fig.1, element 26),
in which at least one drive motor for positioning of a machine part is coupled via one or more transmission elements to the machine part (see fig.1, element 4),
the device comprising: a direct measurement system connected to the machine part being moved by the least one drive motor configured to measure an actual position of the machine part being moved (see fig. 1, element 58 and 60);

an indirect measurement system configured to indirectly determine a position of the moving machine part located at at least one location in a transmission chain(see fig. 1 element 14);

Delio does not disclose a control unit configured to compare determined position measured values and to determine a disturbance when the comparison of the determined position measured values fulfills a prescribed criterion

However, Gebauer et al. a control unit configured to compare determined position measured values and to determine a disturbance when the comparison of the determined position measured values fulfills a prescribed criterion(see col. 3, lines 16-20).

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify Delio's invention to include a control unit that determines a disturbance. One of ordinary skill in the art would have been motivated to do this modification because general control units operate this manner as suggested by Gebauer.

Regarding claim 13, Delio in combination with Gebauer et al. disclose all the limitations based on claim 12. Delio further discloses a device wherein the direct measurement system is a linear measurement system connected to the machine part being moved (see col. 5, lines 61-61).

Regarding claim 14, Delio in combination with Gebauer et al. disclose all the limitations based on claim 13. Delio further discloses a device wherein the linear measurement system is a phase grating length measurement system (see col. 5, lines 61-66).

Regarding claim 15, Delio in combination with Gebauer et al. disclose all the limitations based on claim 13. Delio further discloses a device wherein the linear measurement system has a stationary phase grating scale and a vertical resonator laser scanning sensor coupled to the machine part being moved (see col. 5, lines 61-66) .

Regarding claim 16, Delio in combination with Gebauer et al. disclose all the limitations based on claim 1. Delio further discloses a device wherein the indirect measurement system is a rotation angle sensor that is one of directly and indirectly coupled to a rotor shaft of the drive motor (see col. 3, lines 35-37 and fig. 1, element 14).

Regarding claim 17, Delio in combination with Gebauer et al. disclose all the limitations based on claim 12. Gebauer further discloses a device as defined in claim 12, further comprising: an active collision protection system used in conjunction with the device for disturbance sensing, wherein the device for disturbance sensing is activated when one of a defect and a failure of the active collision protection system occurs(see col. 4, lines 34-40 and col. 10, lines 61-66).

Regarding claim 18, Delio in combination with Gebauer et al. disclose all the limitations based on claim 1. Delio further discloses a device as defined in claim 17 further comprising: a proximity sensor connected to the moving machine part and configured for use as the active collision protection system (see col. 5, lines 61-66).

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delio U.S. Patent No. 5,170,358 in combination with Gebauer et al. U.S. Patent No. 4,748,554 and further in view of Kato et al. U.S. Patent No. 5,719,479.

Delio in combination with Gebauer et al. discloses all the limitations based on claim 4. But they fail to disclose a method wherein the actual operating conditions include at least one of inertial forces during acceleration of the moving machine part, process forces of work place machining and friction forces in the drive system.

However Kato's reference discloses a method wherein the actual operating conditions include at least one of inertial forces during acceleration of the moving machine part, process forces of work place machining and friction forces in the drive system (see col. 5, lines 1-3).

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include inertial forces and friction forces in the actual operating conditions.

One of ordinary skill in the art would have been motivated to do this modification because these parameters are necessary in such control systems as suggested by Kato.

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Delio U.S. Patent No. 5,170,358 in combination with Gebauer et al. U.S. Patent No. 4,748,554 and further in view of Mochizuki et al U.S. Patent No. 5,414,632.

Delio in combination with Gebauer et al. discloses all the limitations based on claim 17. But they fail to disclose a device comprising: an image processing system configured for use as the active collision protection system and further configured to record the size and position of elements in a work space of the machine tool.

However, Mochizuki's reference discloses a device comprising: an image processing system configured for use as the active collision protection system and further configured to record the size and position of elements in a work space of the machine tool (see col. 3, lines 67-68 and col. 4, lines 1-3 and lines 17-21).

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify a machine tool and include a system for image processing

One of ordinary skill in the art would have been motivated to do this modification because an image processing system would provide more capability to the system as suggested by Mochizuki.

Response to Arguments

Applicant's arguments filed 10/02/03 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., sensing the relative position of tool to workpiece and position control in cycling a control program) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to method and device for disturbance sensing, especially collision sensing, in the drive system of a numerically controlled machine tool:

a. U.S. Pat. No. 4,733,343 to Yoneda et al, which discloses a machine tool numerical controller with a trouble stop function.

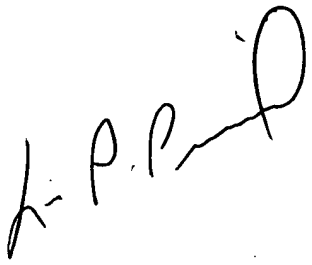
b. U.S. Pat. No. 5,587,915 to Nagatomi, which discloses a tool damage prevention system.

c. U.S. Pat. No. 5,895,177 to Iwai et al, which discloses a machine tool with fault detection.

d. U.S. Pat. No. 5,969,817 to Ohsawa, which discloses a precision indexing angle measuring method and system for machine tools.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Ortiz-Rodriguez whose telephone number is (703)305-8009. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (703)308-0538. The fax phone number for the organization where this application or proceeding is assigned is (703)308-6606.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4750.



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Carlos Ortiz-Rodriguez

Patent Examiner

Art Unit 2125

cror

December 8, 2003